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### **REMARKS**

Claims 15, 18-20, 25, 37-38, 40-41, 44, 46-47, 50, 52, and 55-57 are the only claims under prosecution in this application.

Applicants have amended the specification on page 27 to correct the numbering for "baffles" and "regenerator".

Applicants have deleted claims 21-23, 39, 42-43, 45, 48-49 and 53.

Applicants have amended claims 15, 20, and 41 to give the forward acute angle a point of reference. Applicants amended claim 19 to clarify the diverging dimension of the atomization zone. Applicants also amended claims 37 and 38 to correct the claim dependency. Applicants also amended claims 25 and 41 to correct antecedent basis errors and add a sparger to claim 41. Applicants request that these amendments be entered to put this application in better form for allowance.

### **Claim Objections**

The Examiner objected to claims 37-39 because of improper claim dependency. Applicants have deleted claim 39 and corrected claims 37-38 to depend from an elected invention.

The Examiner objected to claims 1 and 20 because of informalities. Claim 1 is not currently under prosecution and applicants have corrected the informalities in claim 20.

### **Rejection Under 35 U.S.C. § 112, second paragraph**

#### **Examiner's Position:**

Claims 15, 18-23, 25, 37-50, 52, 53 and 55-57 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention.

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**Applicants' Position:**

Applicants deleted claims 21-23, 39, 42-43, 45, 48, and 49. Applicants amended claims 15, 19, 20, 25, 37, 38, and 41 as stated above to correct the Examiner's rejections. Therefore, applicants request that this rejection be withdrawn.

**Rejection Under 35 U.S.C. § 102(b)**

Claims 41, 42 and 44-47 are rejected under 35 U.S.C. § 102(b) as being anticipated by Metrailler et al. (U.S. 2,952,619) for the reasons set forth in the office action.

**Applicants' Position:**

Applicants have deleted claims 42 and 45. Thus, the remaining claims under the 102(b) rejection are 41, 44, 46, and 47. The presently amended claim 41 contains a second inlet, which is a sparger comprised of a cylindrical conduit containing a plurality of sparger fluid passageways. Metrailler et al. do not contain a second inlet that is a sparger. Claims 44, 46, and 47 all depend from patentable claim 41. Therefore, applicants request that this rejection be withdrawn.

**Rejection Under 35 U.S.C. § 103(a)**

**Examiner's Position:**

Claims 15, 18-23, 25, 37-38, 40-50, 52, 53 and 55-57 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Piotter (U.S. 4,931,171).

The Examiner argues that Piotter et al. discloses an apparatus comprising a central passageway; an atomization zone; a plurality of atomization fluid passageways fluidly communicating with the central passageway via atomization fluid passageway outlets positioned concentrically about a perimeter of the central passageway; a heating zone; a mixing zone comprising a first inlet for a fluid to be atomized and a second inlet positioned upstream of said central passageway; and a stream splitter similar to the present invention. Applicants disagree.

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**Applicants' Position:**

The apparatus of the present invention is designed to produce small liquid drops from a gas-liquid mixture without a change in chemical composition. There is no need for cooling, quenching, swirling, or ignition in the present invention. This is the complete opposite from Piotter et al. Piotter et al. specifically disclose a mixing device for a combustion between two gaseous species: fuel and air or steam. It is important for the Piotter mixing device to achieve intimate mixing at the molecular level for a prescribed air-to-fuel ratio. See Figure 6. Ignition of the fuel-air mixture in Piotter et al. is affected by spark plug 214 (column 18, line 57). Thus, the operating conditions (flow regime, internal design, temperature, residence time, hydrodynamics, etc.) of the present invention are totally different from those used in Piotter et al. The purpose of Piotter et al. is about combustion, which is a chemical reaction. One having ordinary skill in the art reading Piotter et al., without reading the instant specification, would not be led to create an apparatus comprising the instantly claimed atomization of heavy liquid with superheated steam, a gas liquid mixture without a change in composition. Therefore, applicants request that this rejection be withdrawn.

The independent claims remaining in prosecution in the present invention are claims 15, 20, and 41. These claims are patentable over Piotter et al. Claims 18-19, 25, 37-38, 40, 44, 46-47, 50, 52, and 55-57 all depend from independent patentable claims 15, 20, and 41 and are therefore also patentable.

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Therefore, in view of the above, and in view of amendments made to claims 15, 19, 20, 25, 37, 38, and 41 applicants request that the Examiner pass this application to allowance. The Examiner is requested to call applicants' attorney should he have any questions regarding this response.

Respectfully submitted,

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